UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Ref: 8EPR-SR   March 17, 2009

MEMORANDUM

SUBJECT: Libby OU3, February 19, 2009 Presentation of Phase IIC Fish and Benthic
            Population Data

FROM: Bonnie Lavelle
   Remedial Project Manager

TO: Libby Asbestos Site OU3 Site File

The attached presentation of data from the fish population survey, benthic invertebrate
community survey, and habitat quality assessment conducted as part of the Phase IIC remedial
investigation was provided to the Biological Technical Assistance Group (BTAG) of Libby OU3
during a conference call on February 19, 2009. The presentation was made by Parametrix. The
following BTAG members participated in the call:

Dan Wall, US Fish and Wildlife Service
Karen Nelson, US Fish and Wildlife Service
Richard Henry, US Fish and Wildlife Service
David Charters, EPA ERT
Bill Brattin, SRC
Janet Burris, SRC
Sue Robinson, Parametrix
Joe Volosin, Parametrix
Bob Medler, Remedium
Bob Marriam, Remedium
Bonnie Lavelle, EPA Region 8

Attachment

Libby Superfund Site OU3: Overview of 2009 Fish, Invertebrate and Habitat Data
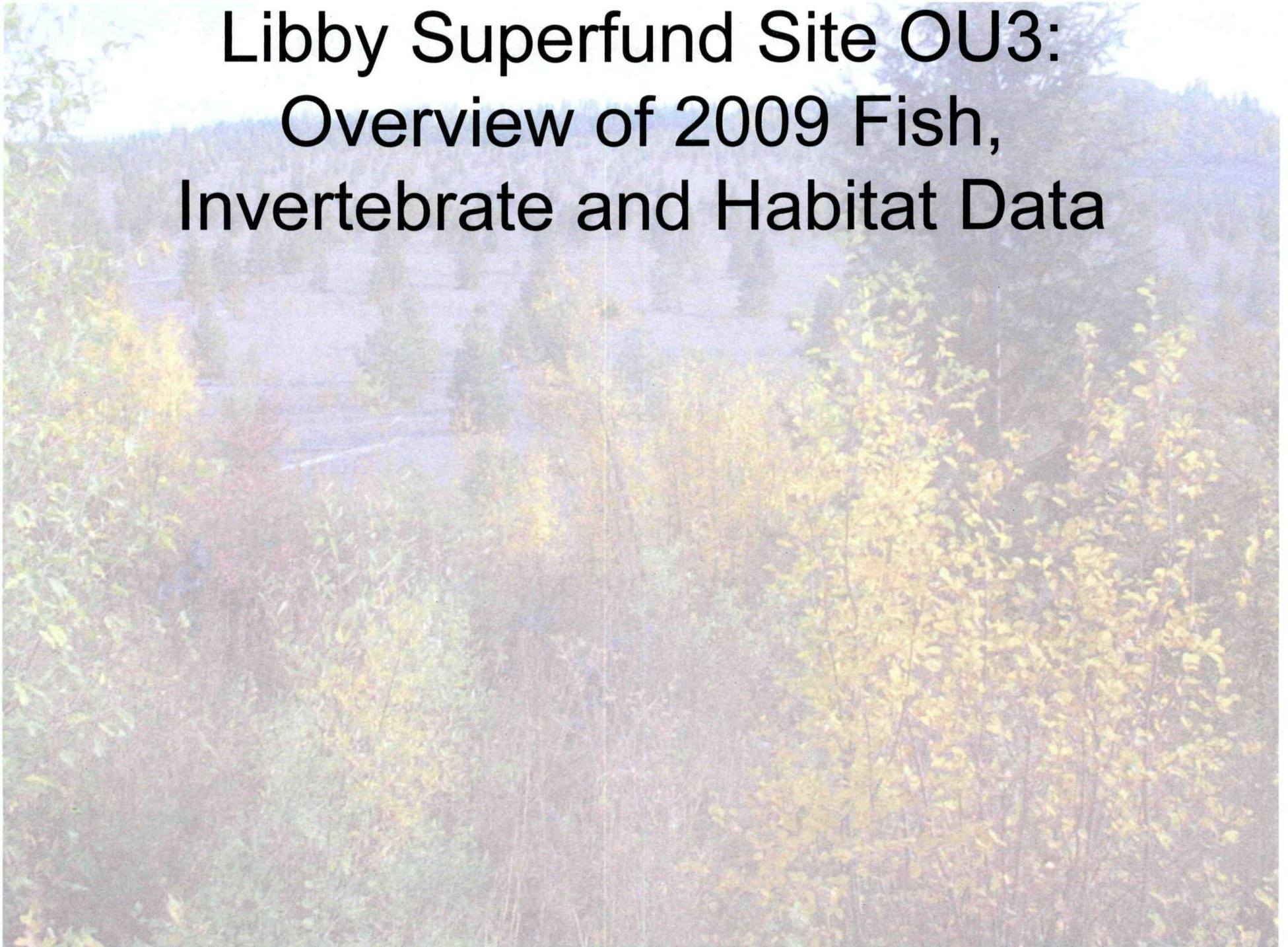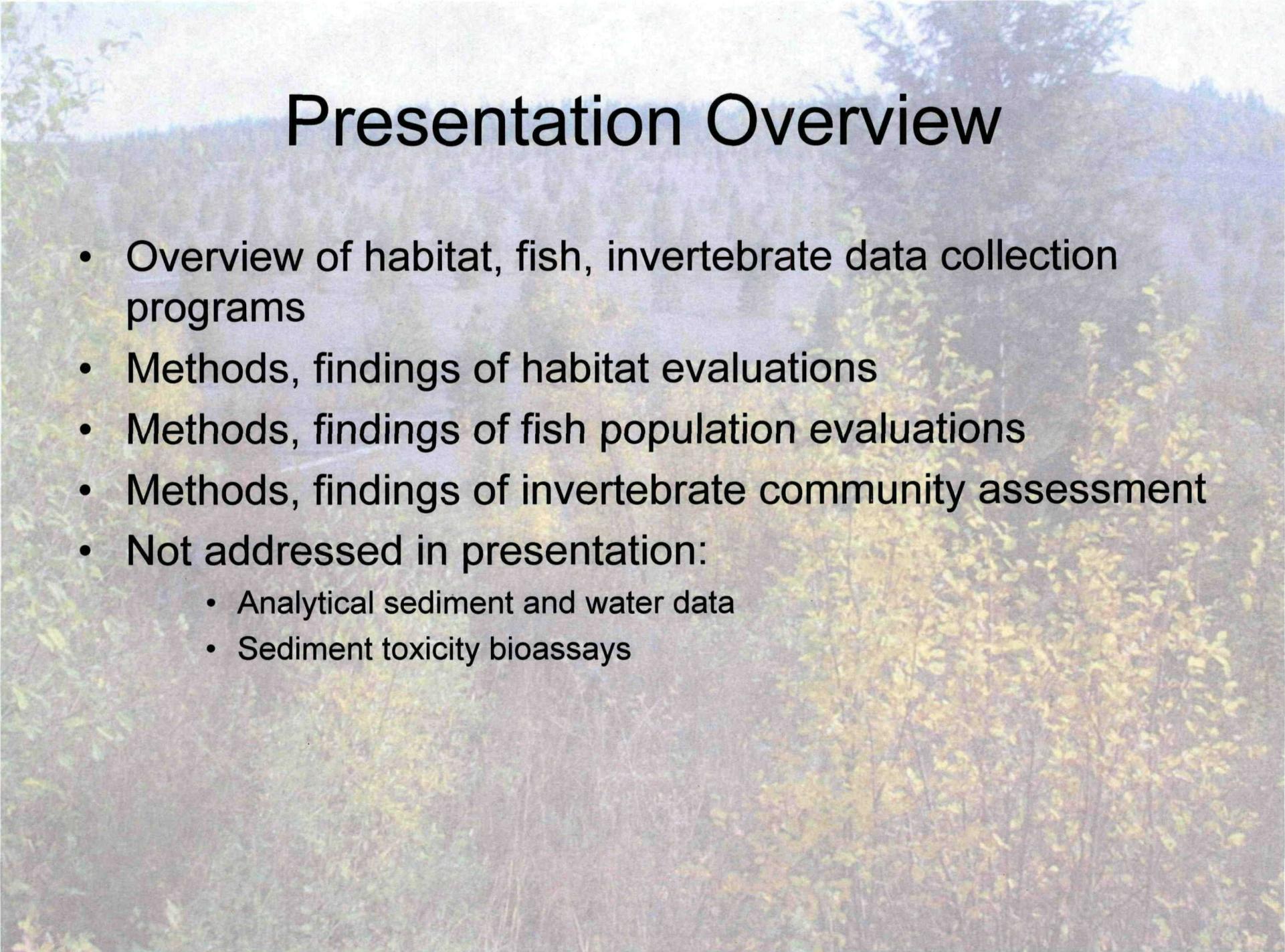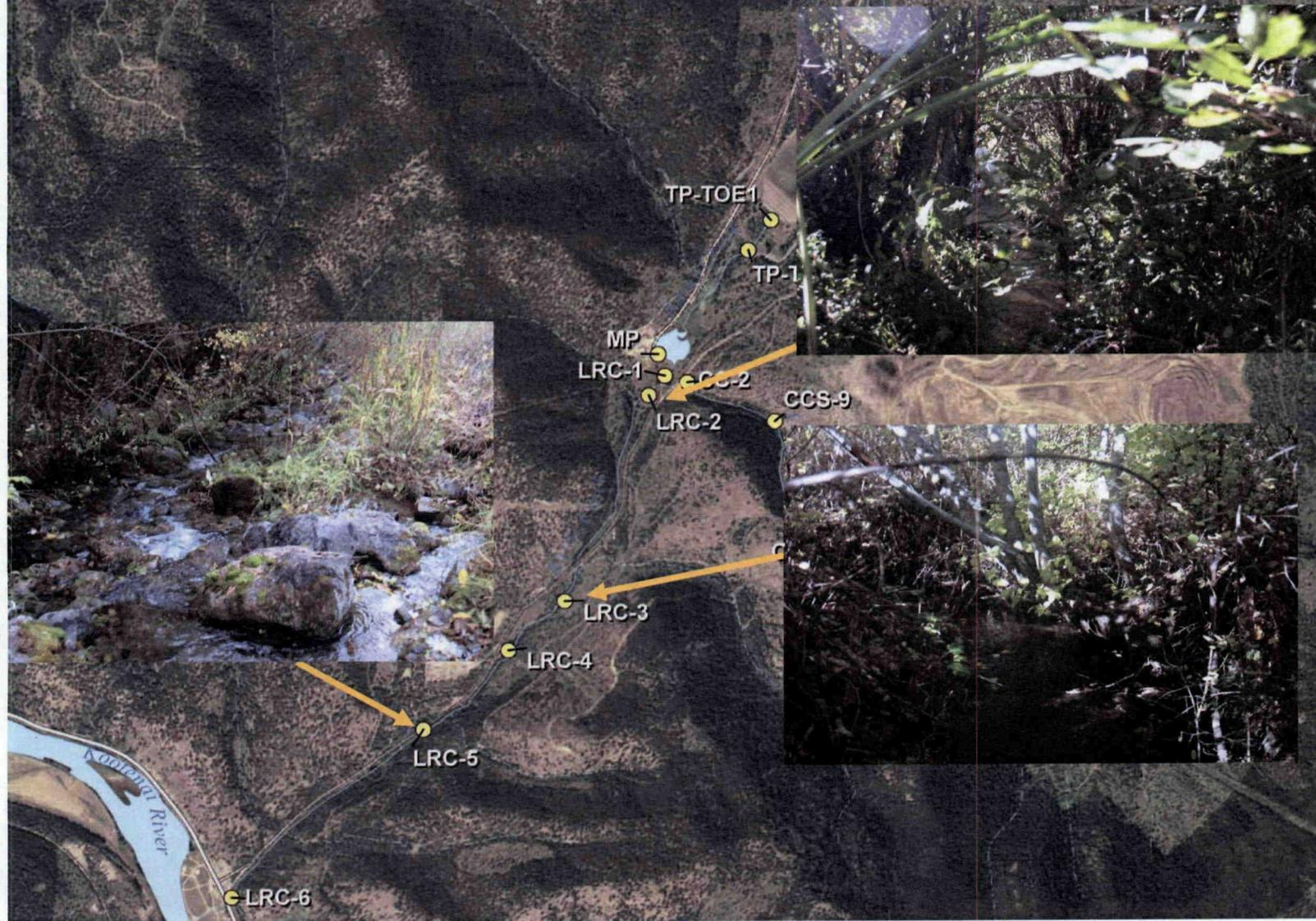
Presentation Overview

- Overview of habitat, fish, invertebrate data collection programs
- Methods, findings of habitat evaluations
- Methods, findings of fish population evaluations
- Methods, findings of invertebrate community assessment
- Not addressed in presentation:
  - Analytical sediment and water data
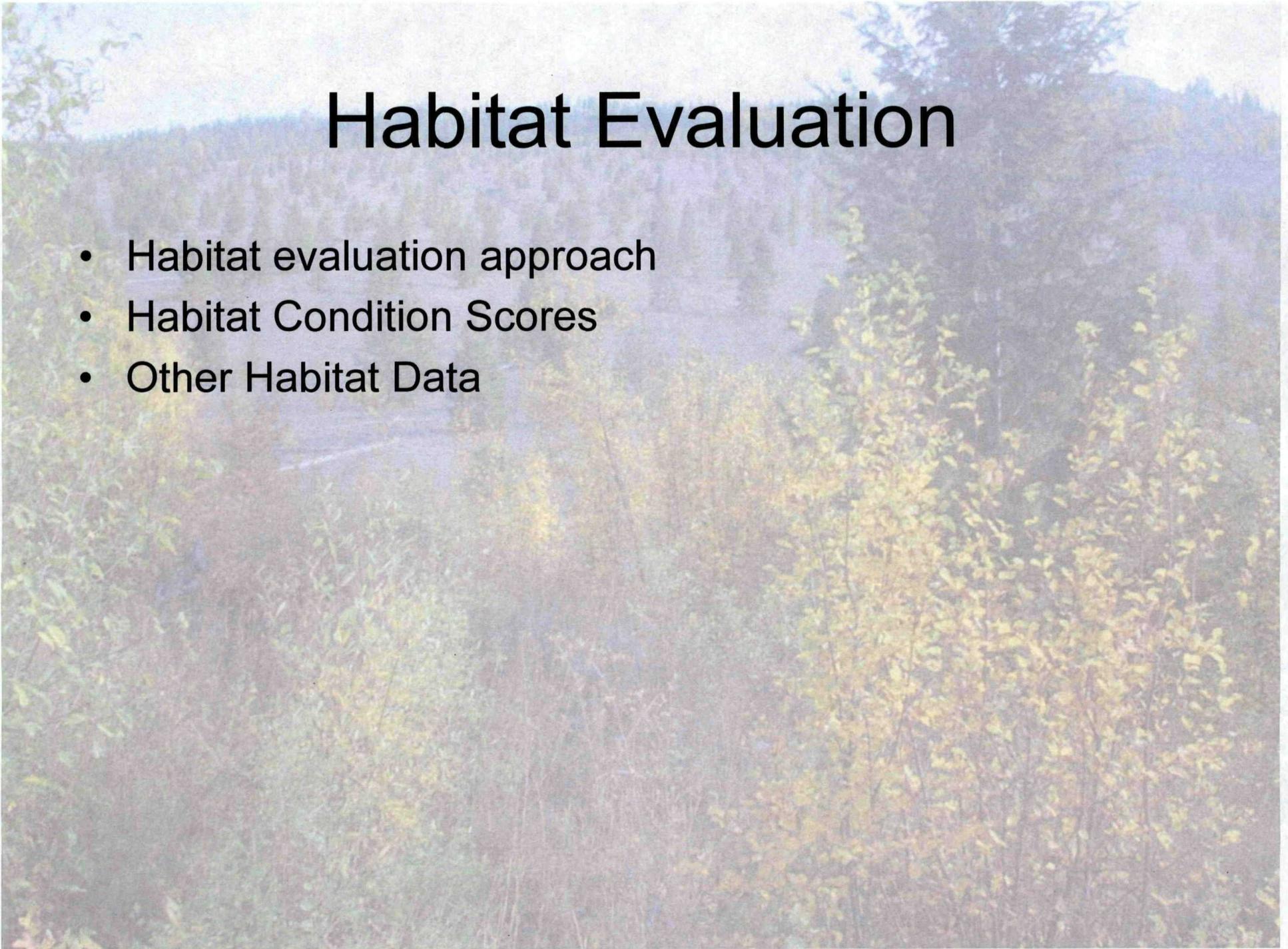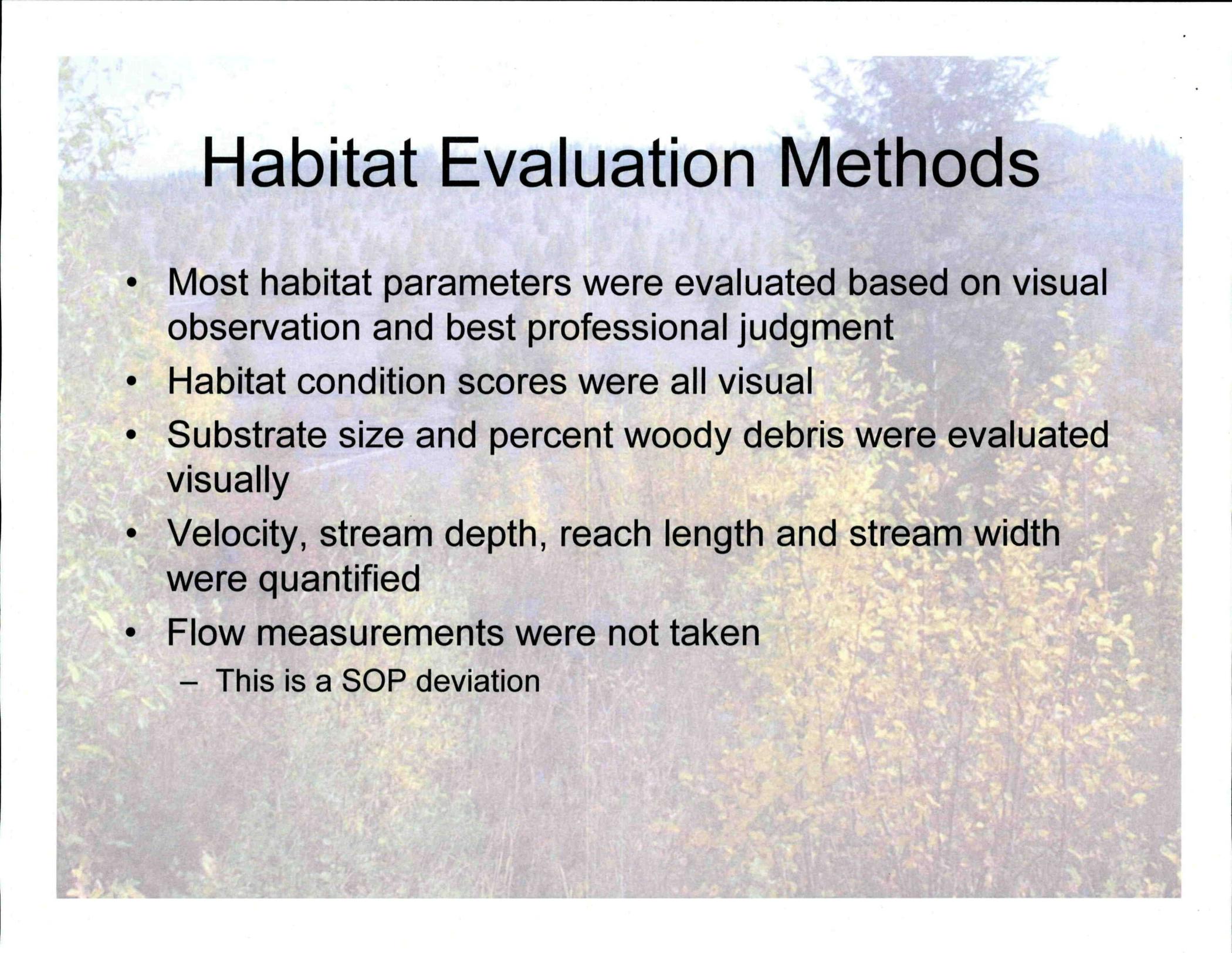 - Sediment toxicity bioassays

URC-1A
URC-2
UTP
TP
TP-TOE1
TP-OVERF
TP-TOE2
MP
LRC-1
CC-2
CCS-9
LRC-2
CCS-6
CCS-8
CC-POND
LRC-3
CC-1
LRC-4
CCS-16
LRC-5
LRC-6
Kootenai River

OU3 Locations

ence Locations

Habitat Evaluation

- Habitat evaluation approach
- Habitat Condition Scores
- Other Habitat Data

Habitat Evaluation Methods

- Most habitat parameters were evaluated based on visual observation and best professional judgment

- Habitat condition scores were all visual

- Substrate size and percent woody debris were evaluated visually

- Velocity, stream depth, reach length and stream width were quantified

- Flow measurements were not taken
  - This is a SOP deviation

Habitat Condition Scores

|	
Epifaunal Substrate/ Available Cover	Channel Flow Status
Embeddedness	Channel Alteration
Velocity/Depth Regime	Frequency of Riffles (or bends)
Sediment Deposition	Channel Flow Status
Bank Stability	Riparian Vegetative Zone Width
Vegetative Protection	

- Habitat Condition Scores
  - based on several habitat parameters
- All scores based on observation only
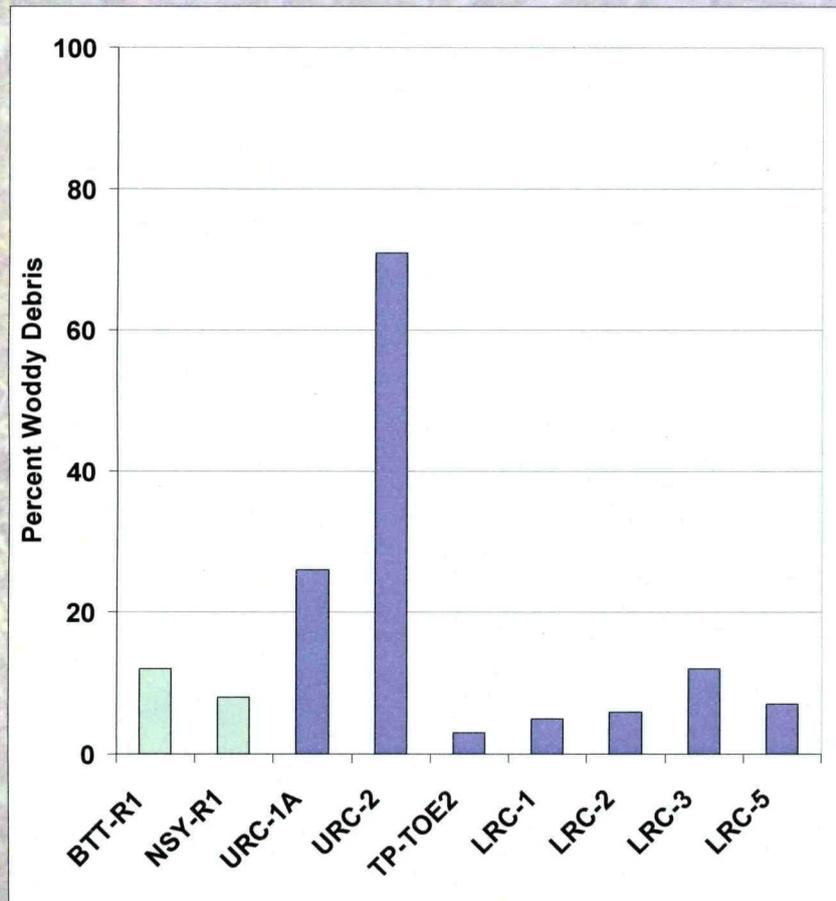
Habitat Condition Scores
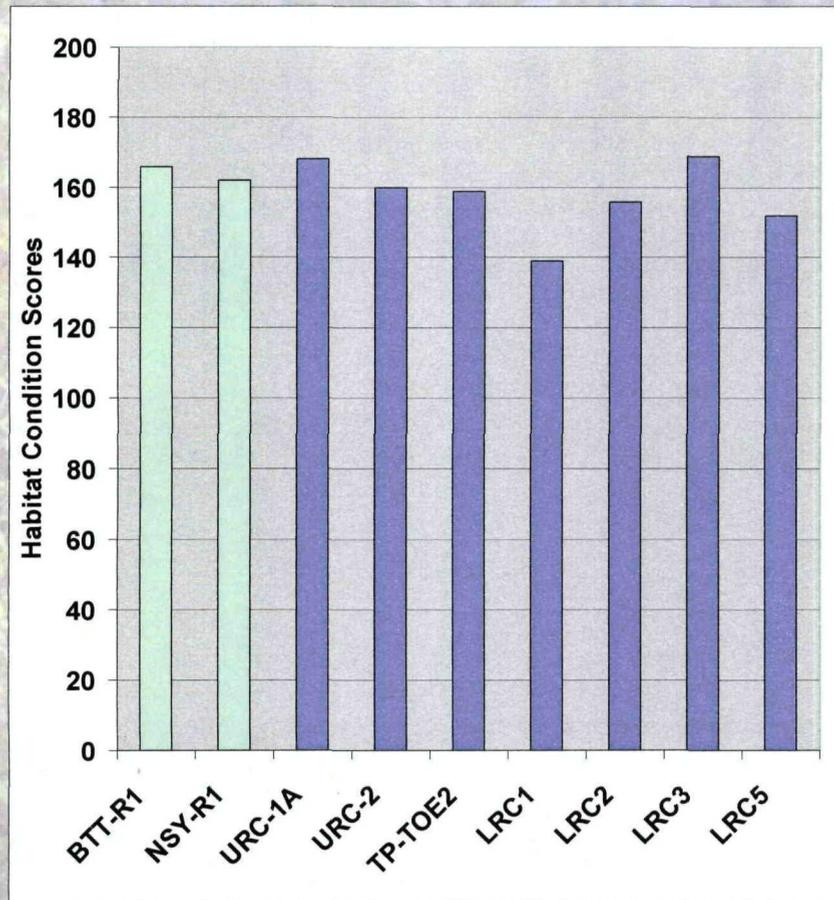
- Habitat Conditions Scores were not too different
- The lower Rainy Creek site, LRC-1, had the lowest score
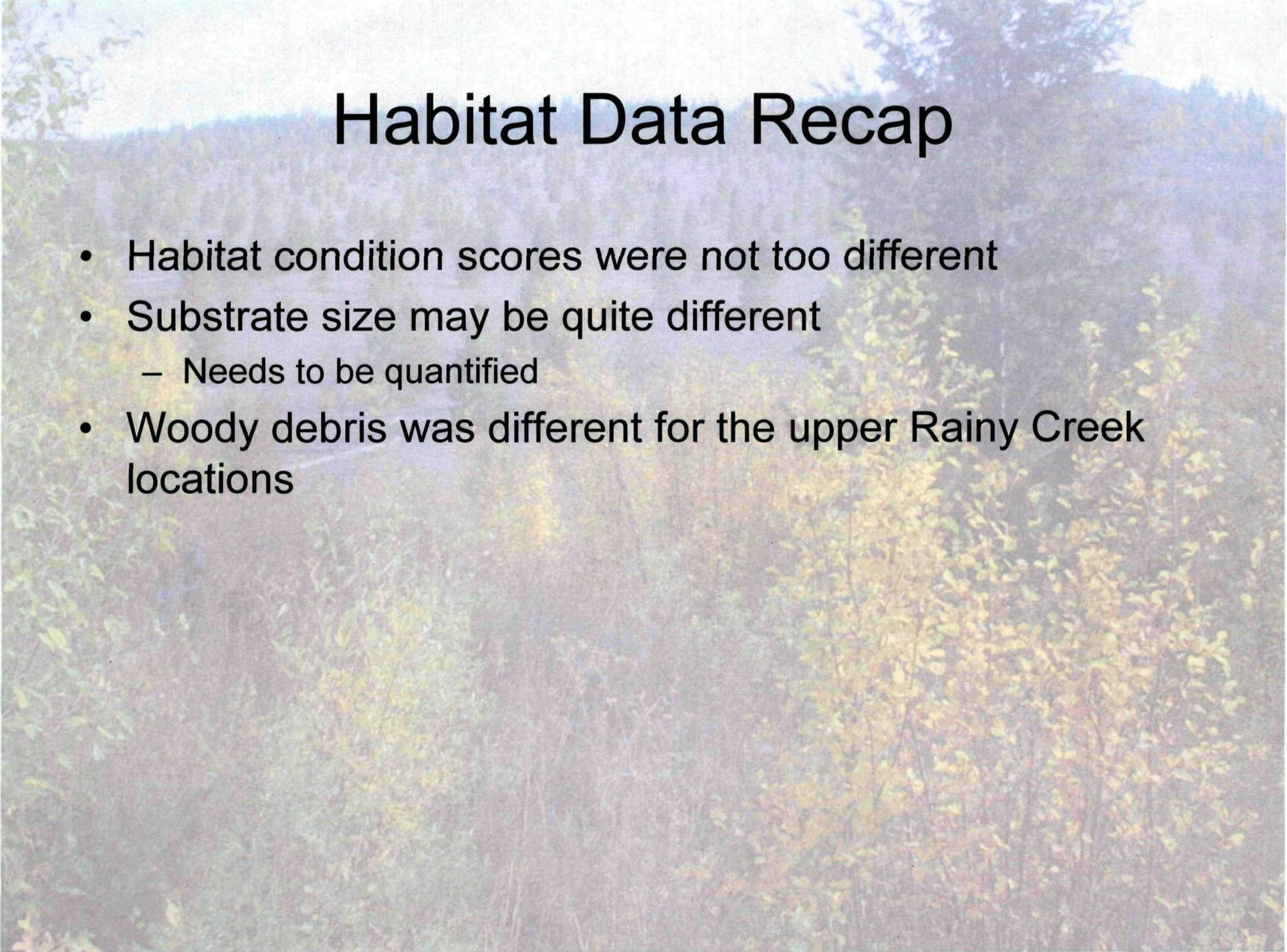
Percent Cobble Substrate
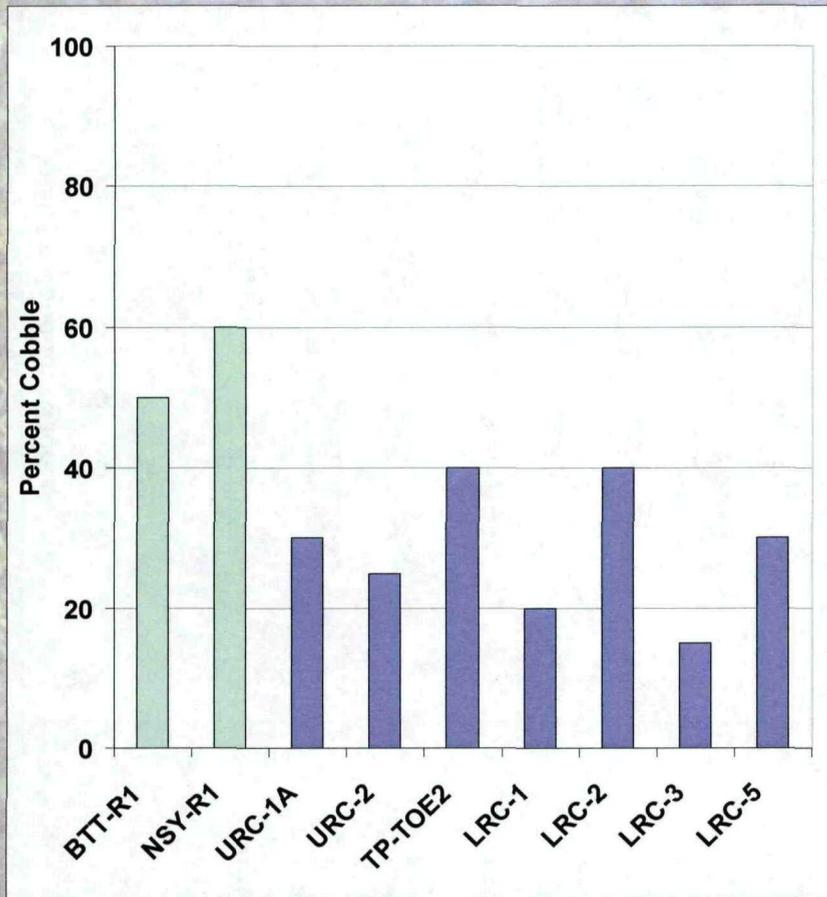
- NSY-R1 and BTT-R1 had the most cobble substrate

- The lower Rainy Creek sites, LRC-1 and LRC-3, had the least cobble substrate

Percent Woody Debris

- NSY-R1 and BTT-R1 had similar woody debris compared to lower Rainy Creek sites

- The upper Rainy Creek sites had much more woody debris than the other sites
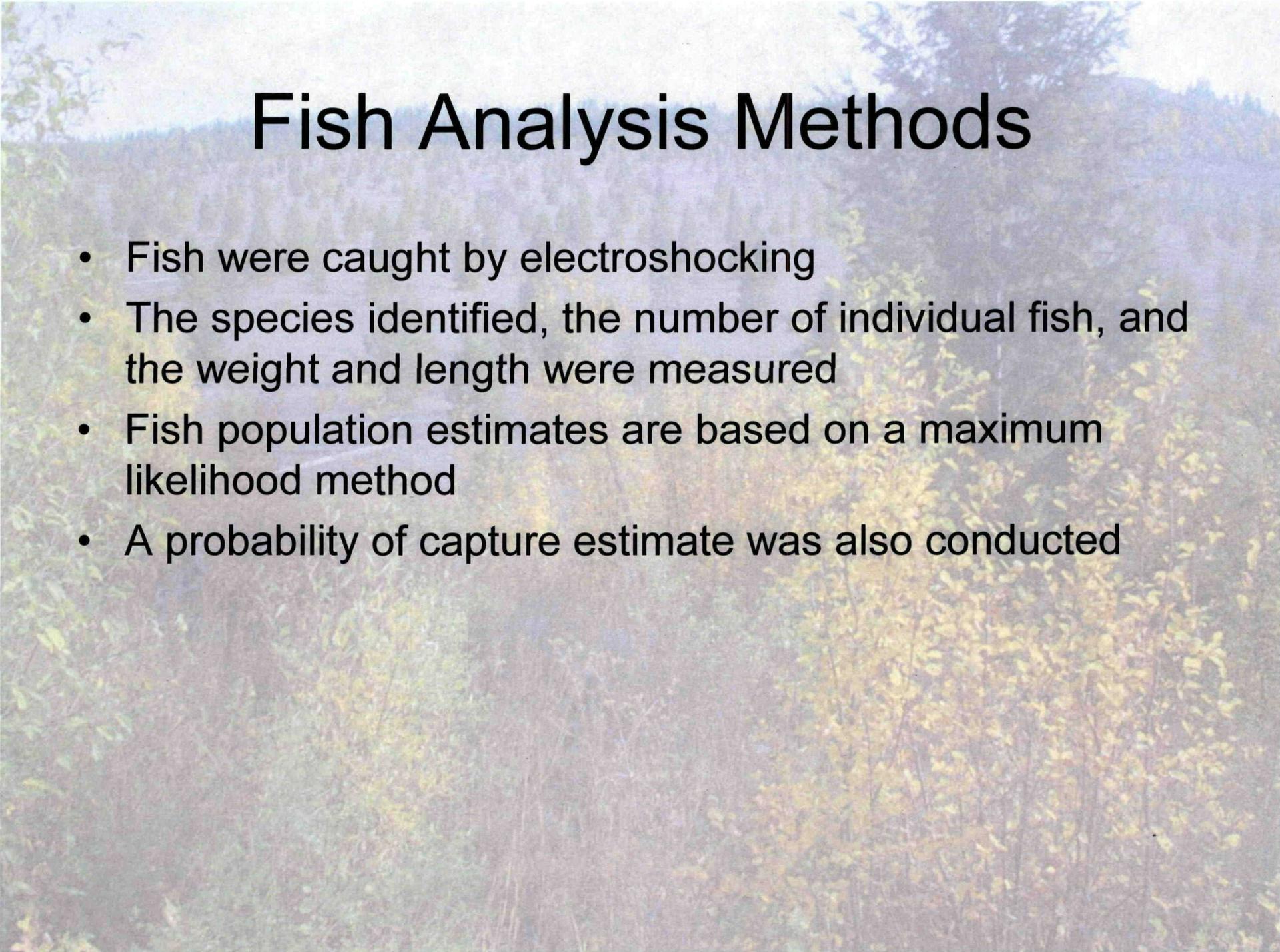
Habitat Data Recap

- Habitat condition scores were not too different
- Substrate size may be quite different
  - Needs to be quantified
- Woody debris was different for the upper Rainy Creek locations
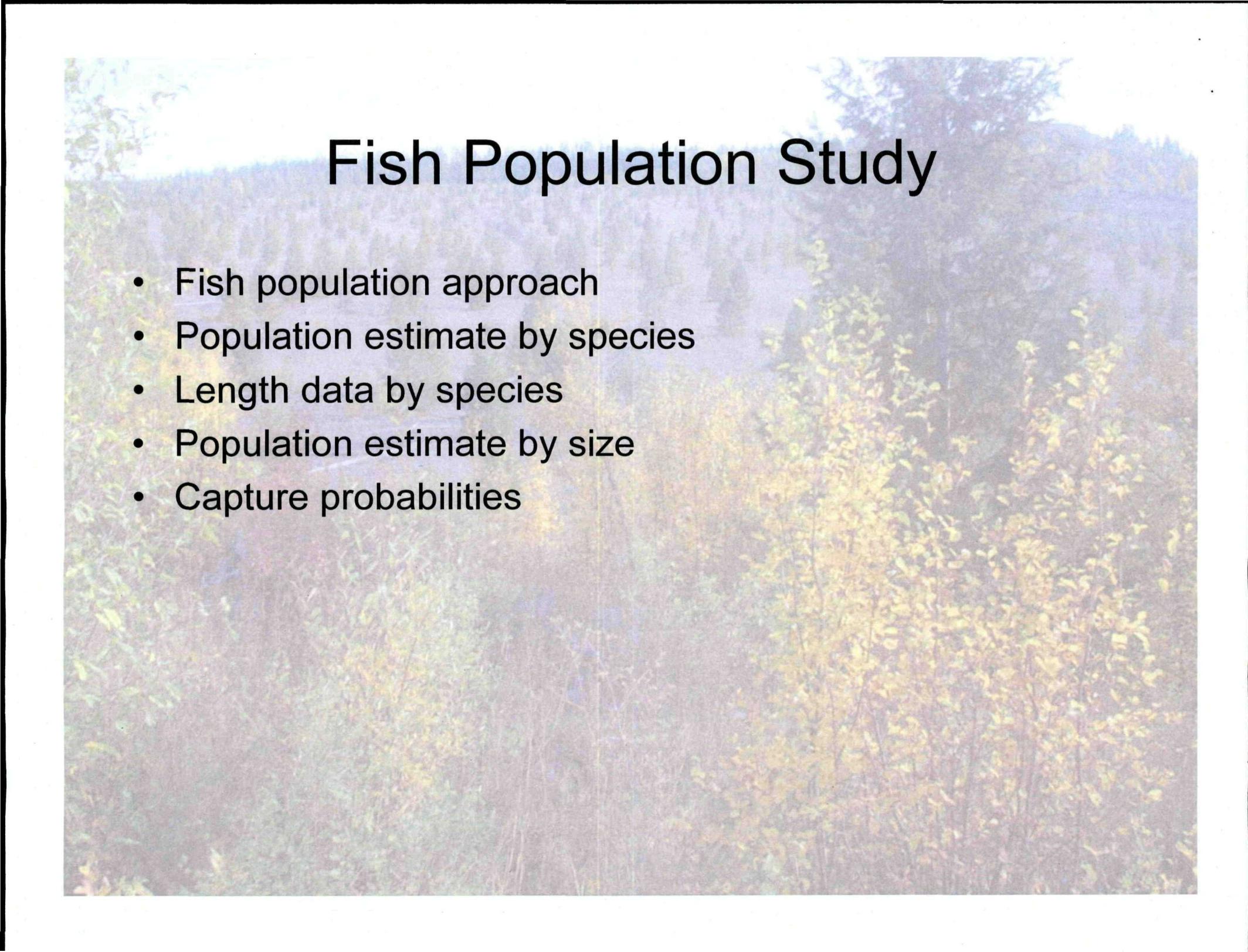
Fish Population Study

- Fish population approach
- Population estimate by species
- Length data by species
- Population estimate by size
- Capture probabilities

Fish Analysis Methods

- Fish were caught by electroshocking
- The species identified, the number of individual fish, and the weight and length were measured
- Fish population estimates are based on a maximum likelihood method
- A probability of capture estimate was also conducted

Population Estimate by Species
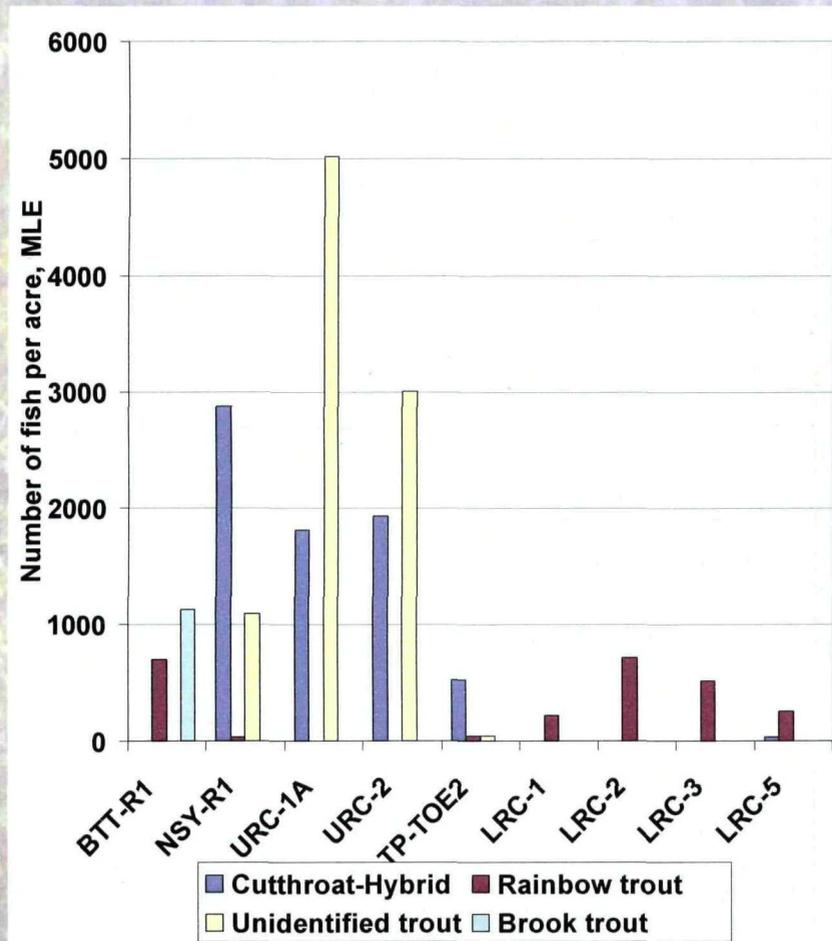
- Cutthroat-Rainbow hybrids were the most numerous fish collected overall, followed by rainbow trout and brook trout

- The lower Rainy Creek sites, LRC-1, LRC-2, LRC-3 and LRC-5, were estimated to have smaller fish population sizes than the other sites

Species Length Data
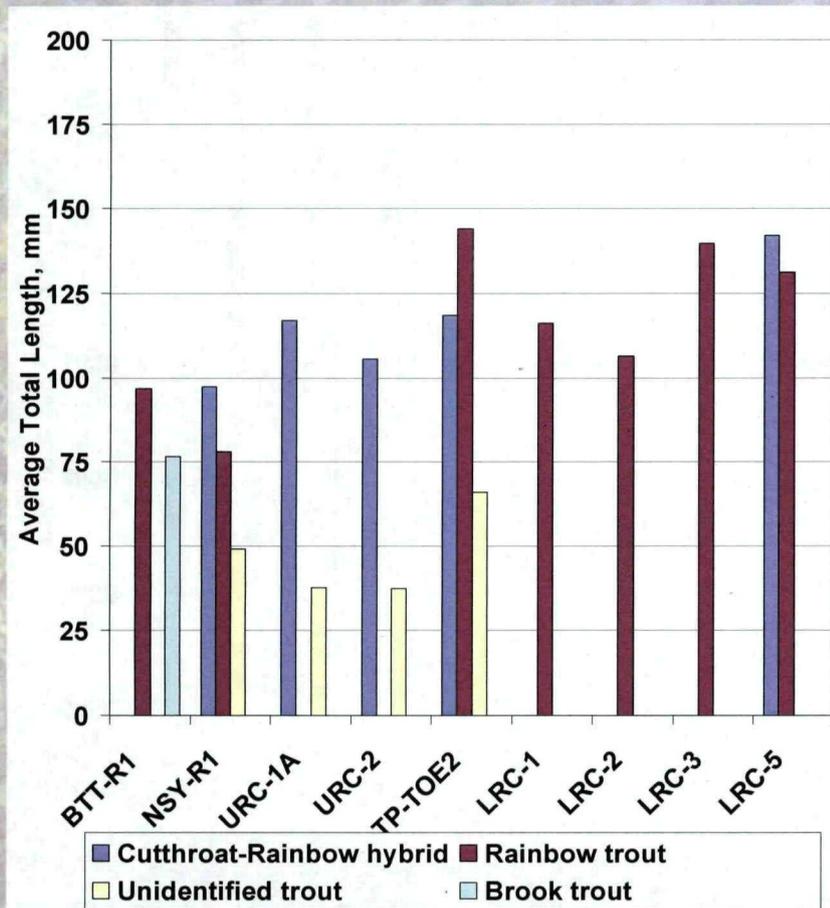
- The fish caught at BTT-R1 and NSY-R1 were slightly smaller than the ones caught at the lower Rainy Creek sites

- The unidentified trout were all <75 mm

Population Estimate by Size

- The lower Rainy Creek sites, all have smaller fish populations in the >65mm size class and there were no fish in the ≤65 size class at these sites

- The upper Rainy Creek site, URC-1A has a trout population that is similar to the reference sites in the >65mm size class

- With the smaller fish, URC-1A and URC-2 have trout populations that seem to be greater than the reference sites

Capture Probabilities by Species

- The capture probabilities (ability to catch the fish) was quite variable with the Cutthroat-Rainbow hybrids

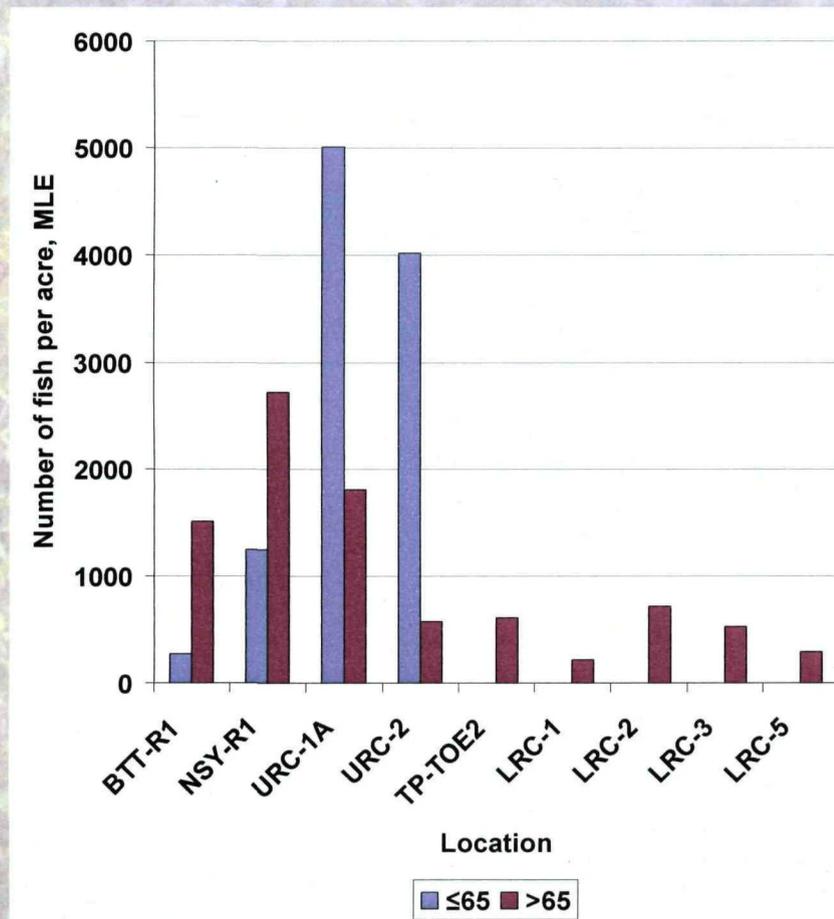- Capture probability for brook trout and the unidentified trout were low

Fish Results Recap

- Cutthroat-Rainbow hybrids were the most numerous fish collected overall, followed by rainbow trout and brook trout

- Lower Rainy Creek sites, LRC-1, LRC-2, LRC-3 and LRC-5, were estimated to have smaller fish population sizes than the other sites
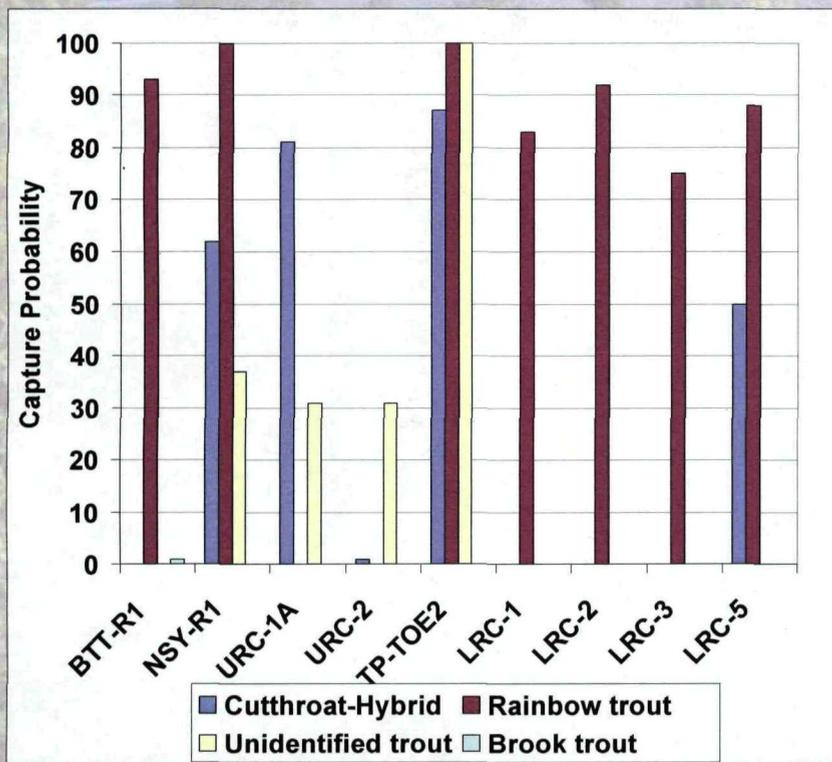
- The upper Rainy Creek sites, URC-1A and URC-2, had similar Cutthroat-Rainbow hybrid population sizes as compared to NSY-R1

- The capture probabilities (ability to catch the fish) was quite variable with the Cutthroat-Rainbow hybrids

Fish Results Recap (cont.)

- The lower Rainy Creek sites all have smaller fish populations in the >65mm size class and there were no fish in the ≤65 size class at these sites

- The upper Rainy Creek site, URC-1A has a trout population that is similar to the reference sites in the >65mm size class
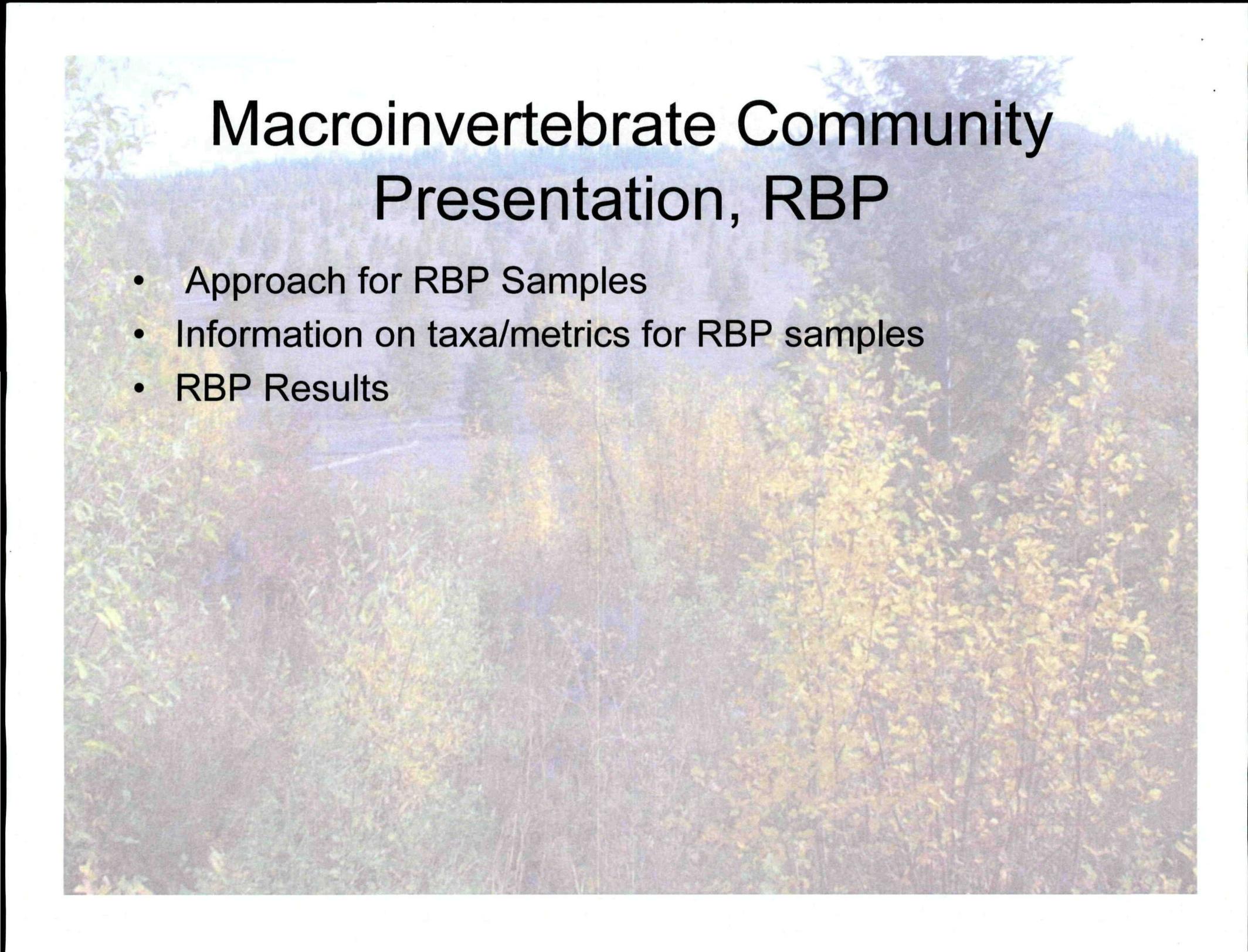
Macroinvertebrate Community Presentation, RBP

- Approach for RBP Samples
- Information on taxa/metrics for RBP samples
- RBP Results

Macroinvertebrate Community Analysis, RBP

- The macroinvertebrate community was ev samples collected following Rapid Bioass Protocol (RBP) methods (kicknet)

- The RBP samples were evaluated with the same metrics and scoring thresholds presented in the Phase III SAP, Figure 4-7

- For the RBP evaluation, all OU3 sites were compared to each reference site

- A correlation analysis was conducted with RBP samples to evaluate sediment quality parameters, habitat and aquatic macroinvertebrates

RBP Scoring Approach

Score	6	4	2	0
Taxa Richness [a]	>80%	60-80%	60-80%	<40%
EPT Taxa Index [a]	>90%	80-90%	70-80%	<70%
Shannon-Weaver Diversity [a]	>85%	70-85%	50-70%	<50%
Percent Ephemeroptera [a]	>50%	35-50%	20-35%	<20%
Percent tolerant organisms [b]	>80%	60-80%	40-60%	<40%
Percent contribution of dominant taxa [c]	<20%	20-30%	30-40%	<40%
Percent scraper feeding group [a]	>50%	35-50%	20-35%	<20%
Percent clingers [a]	>50%	35-50%	20-35%	<20%

[a] = Score is a ratio of a study site to a reference site x 100.

[b] = Score is a ratio of a reference site to a study site to x 100.

[c] = Scoring criteria is not dependent on the reference, actual percent.

- Most scores are based on a comparison to a reference site
- All metrics have equal weight in final score

RBP Total Number of Taxa
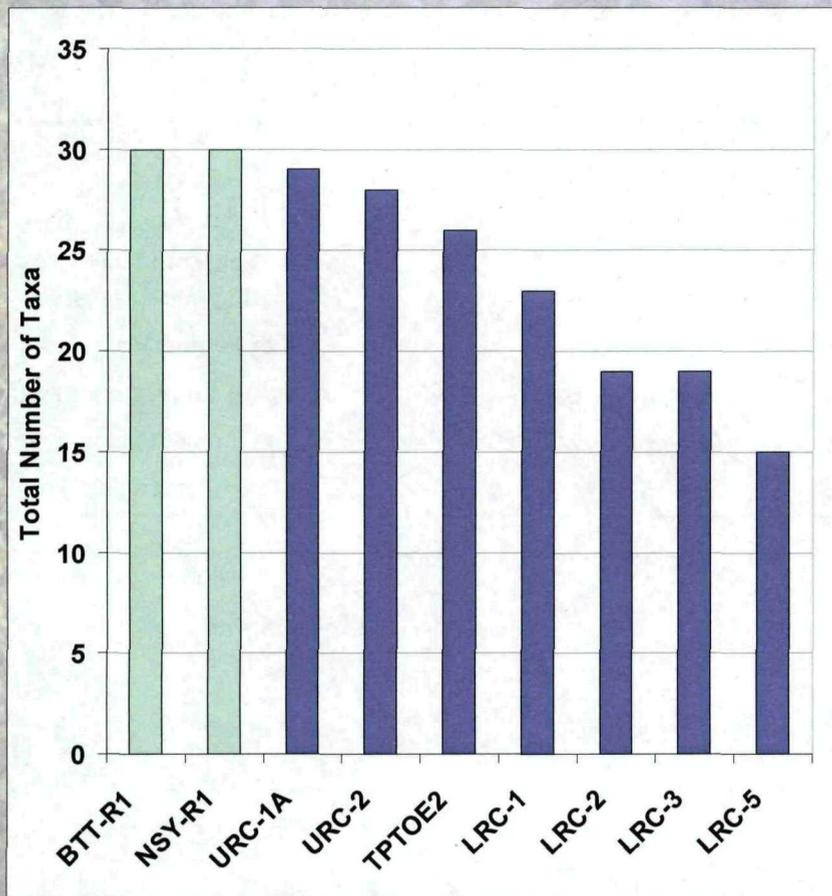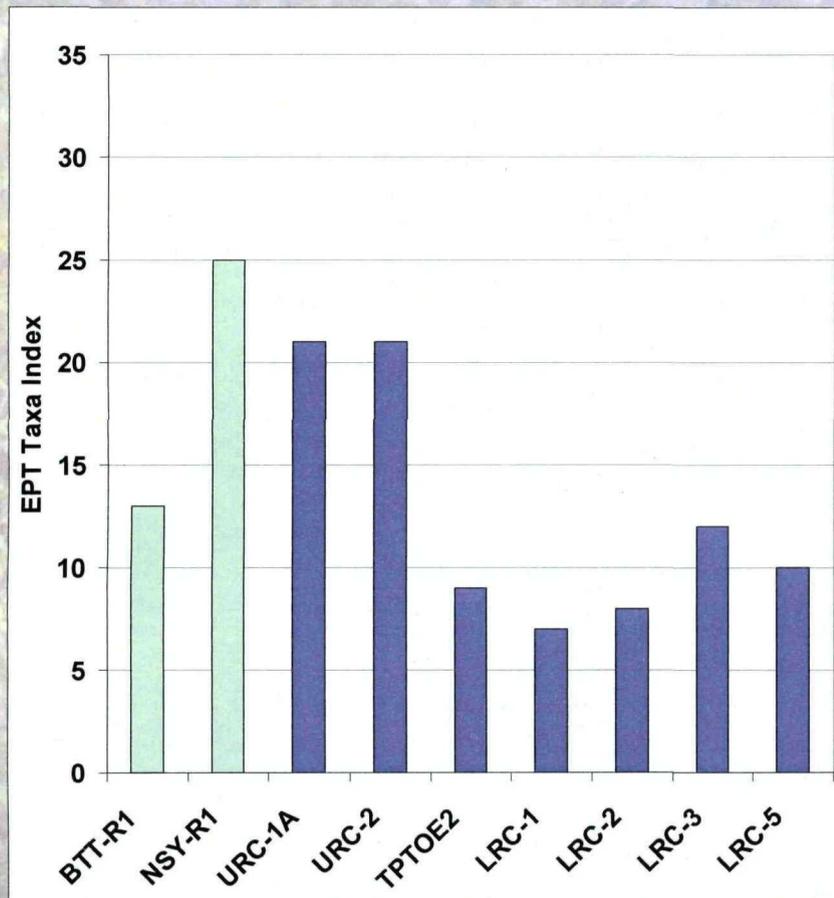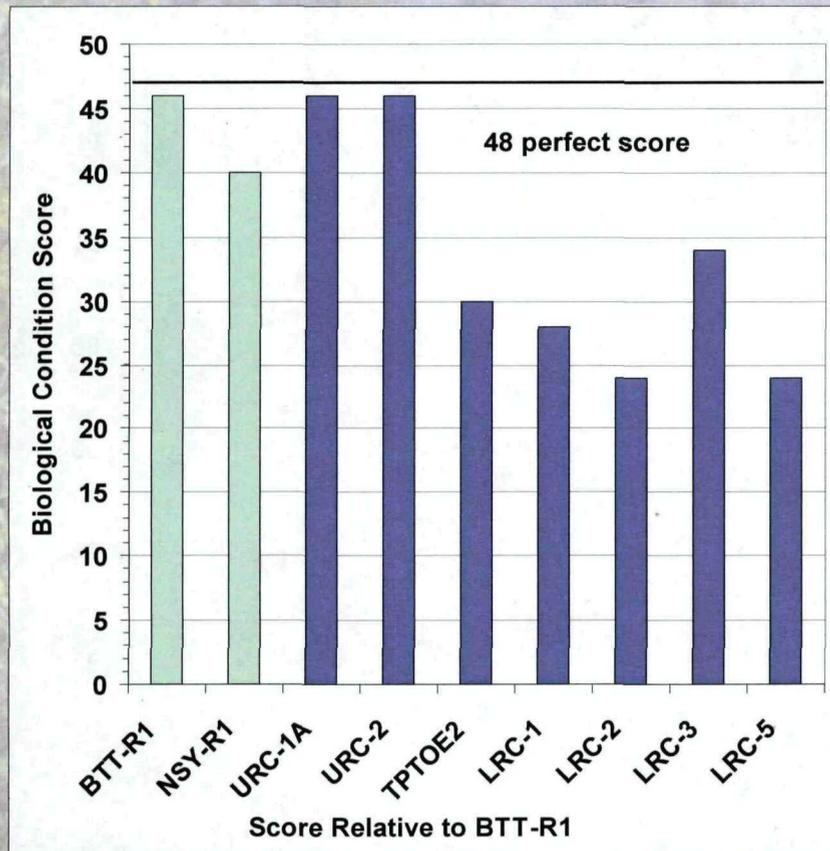

- Reference sites had higher numbers of taxa than, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5
- The number of taxa at URC-1A and URC-2 were similar to the reference sites

RBP EPT Taxa

- BTT-R1 had similar numbers of Ephemeroptera, Plecoptera and Trichoptera (EPT) taxa to LRC-3 and LRC-5

- NSY-R1 had higher numbers of EPT taxa than TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5

- The number of EPT taxa at URC-1A and URC-2 were similar to NSY-R1

RBP Biological Condition Score

Biological Condition Score vs Score Relative to BTT-R1. 48 perfect score. Categories: BTT-R1, NSY-R1, URC-1A, URC-2, TPTOE2, LRC-1, LRC-2, LRC-3, LRC-5.

- BTT-R1 had a higher total score than, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5

- The total scores for BTT-R1, URC-1A and URC-2 were the same

RBP Biological Condition Score
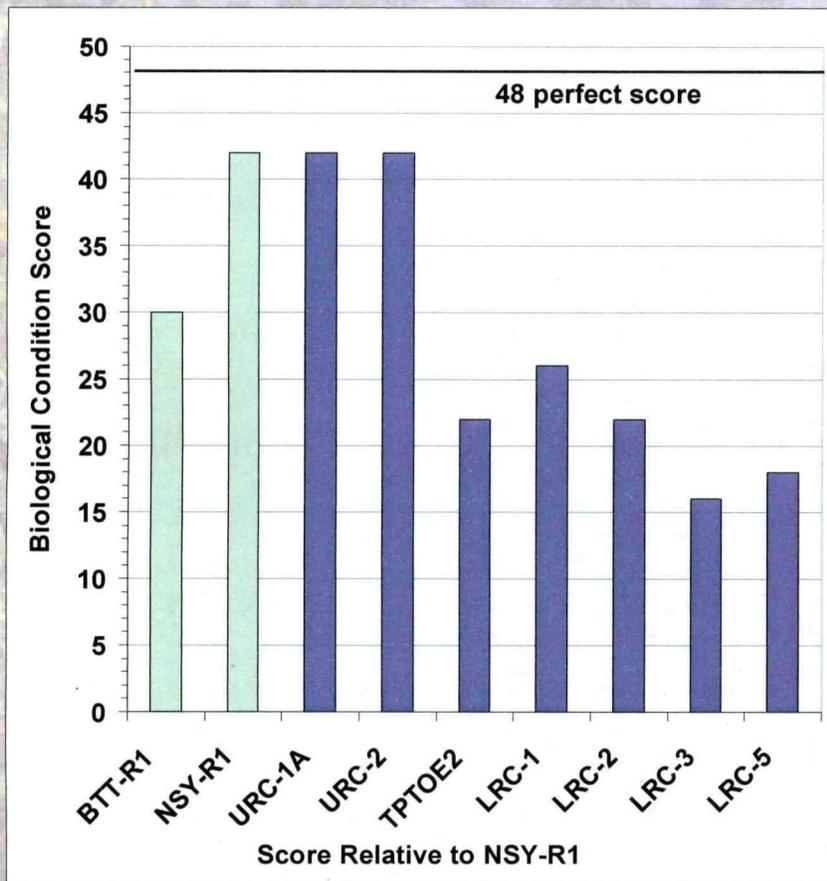
- The reference site, NSY-R1 also had a higher biological condition score than the lower Rainy Creek sites

- Relative to NSY-R1, the reference site BTT-R1 has a low score and is similar to LRC-1

- As with BTT-R1, NSY-R1 had the same scores as URC-1A and URC-2
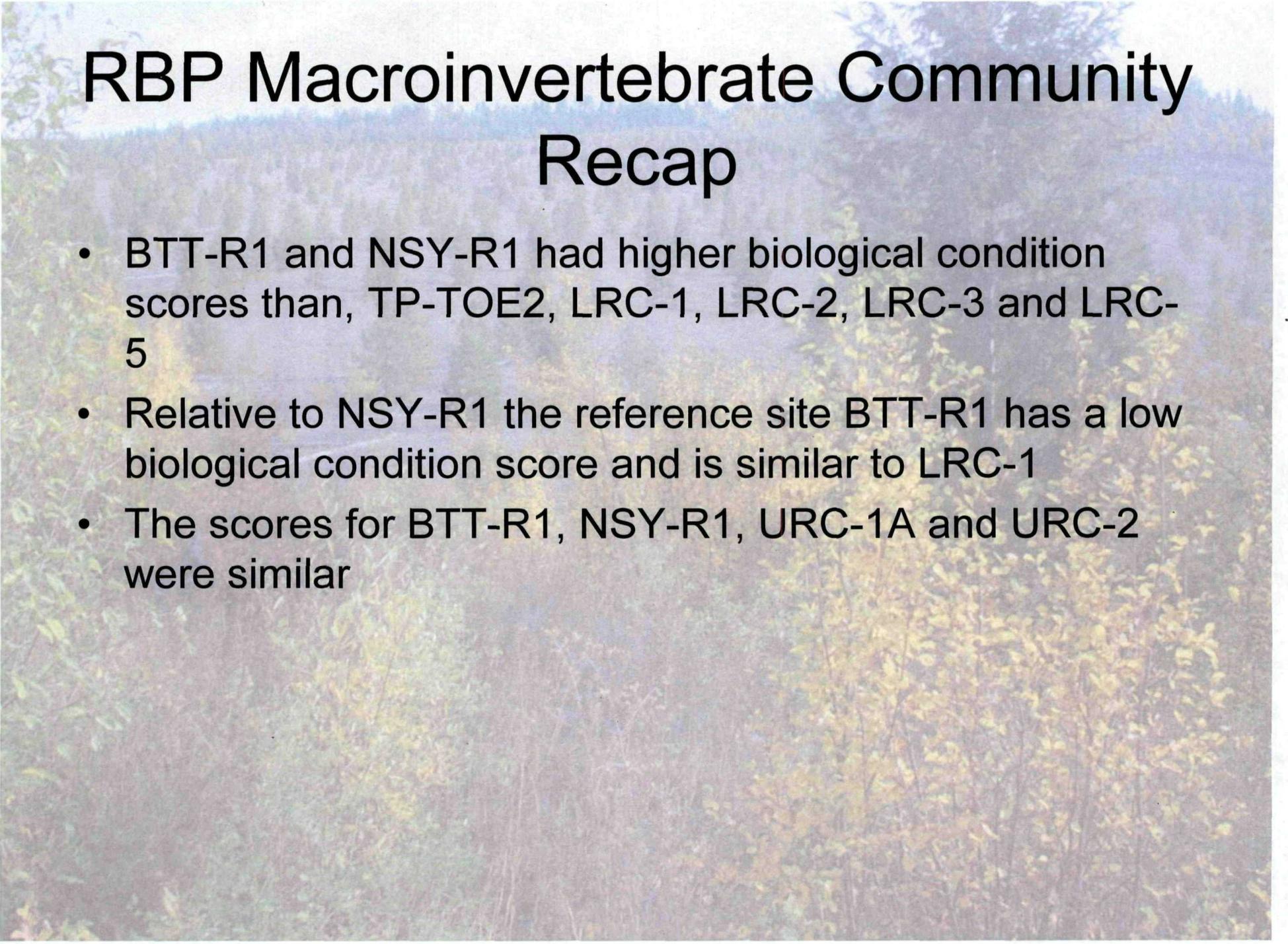
RBP Macroinvertebrate Community Recap

- BTT-R1 and NSY-R1 had higher biological condition scores than, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5

- Relative to NSY-R1 the reference site BTT-R1 has a low biological condition score and is similar to LRC-1

- The scores for BTT-R1, NSY-R1, URC-1A and URC-2 were similar
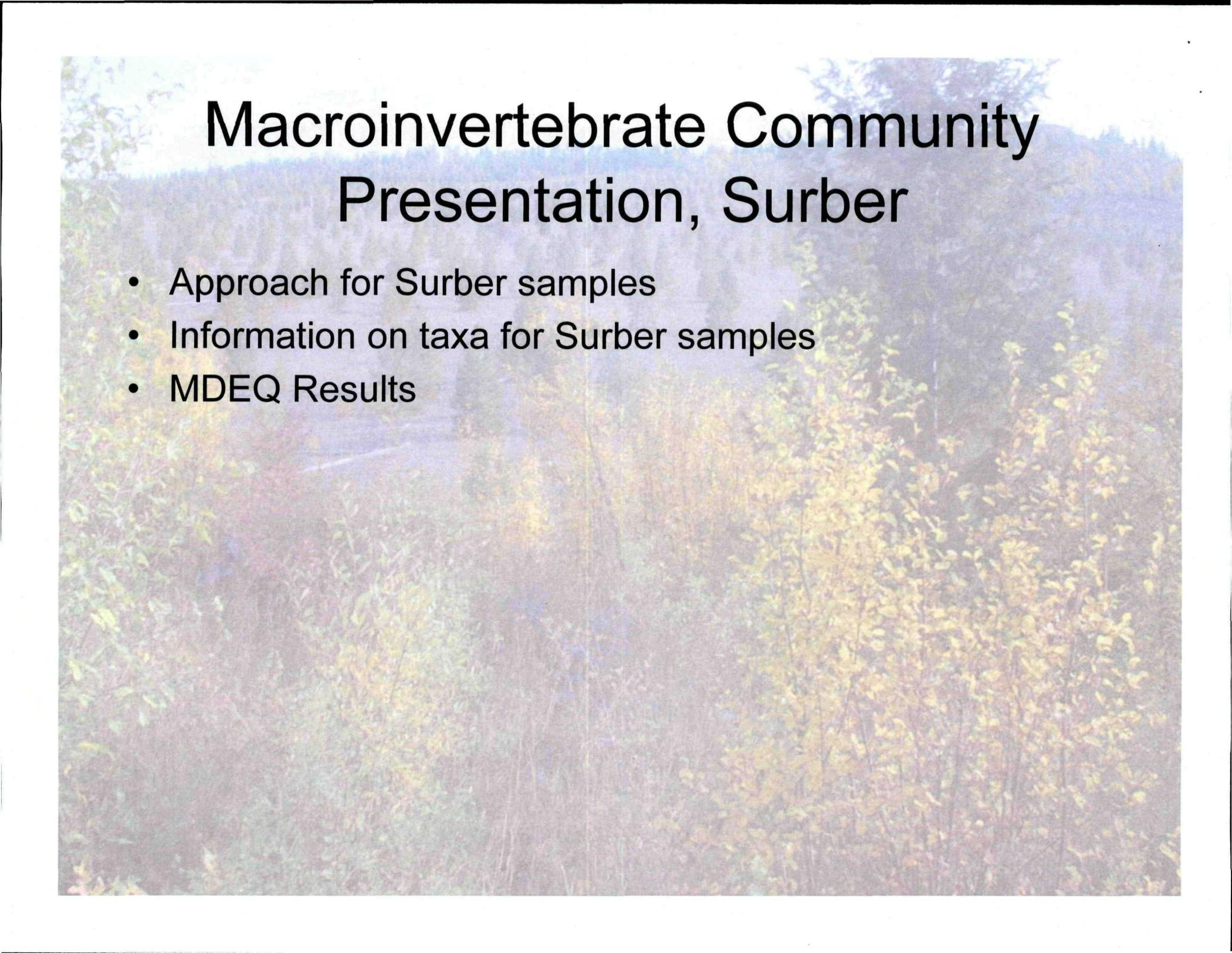
Macroinvertebrate Community Presentation, Surber

- Approach for Surber samples
- Information on taxa for Surber samples
- MDEQ Results

Macroinvertebrate Community Analysis

- The macroinvertebrate community w[...] using samples collected following a [...] method

- The Surber samples was evaluated with a set metrics and scoring thresholds developed by the MDEQ for montane streams

- For the Surber evaluation, all OU3 sites were compared to each reference site
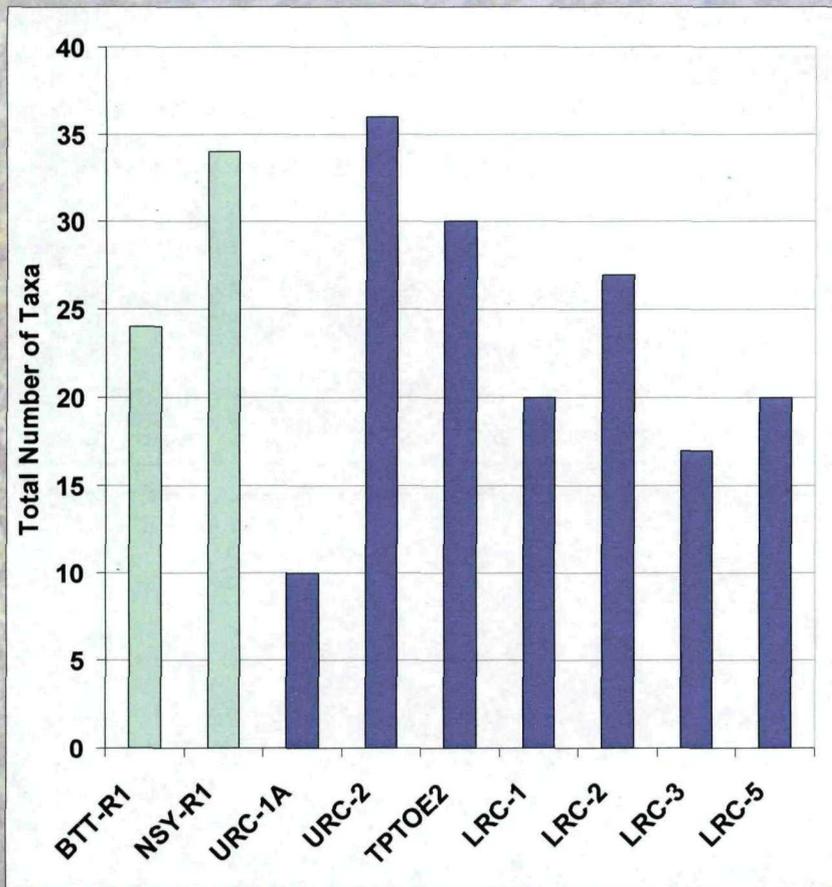
MDEQ Scoring Approach

| Score	3	2	1	0
Taxa Richness	>28	28 - 24	23 - 19	< 19
EPT Taxa Richness	>19	19 - 17	16 - 15	< 15
HBI Score	<3	3-4	4.01 - 5	> 5
Dominant taxa, %	< 25	25 - 35	35.01 - 45	> 45
Collector Gatherer, % abundance	< 60	60 - 70	70.01 - 80	> 80
EPT, % abundance	> 70	70 - 55.01	55 - 40	< 40
Scraper and Shredder, % abundance	> 55	55 - 40.01	40 - 25	< 25

- All scores are based on the site in question
- All metrics have equal weight in final score

Total Number of Taxa in Surber Samples

- There were low total taxa richness numbers at URC-1A and BTT-R1
  - Differs from RBP findings
- The lower Rainy Creek sites, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5, all had lower total taxa richness numbers than NSY-R1
- There were more taxa at TP-TOE2 and LRC-2 than at BTT-R1
- The upper Rainy Creek site, URC-2 had more taxa than NSY-R1 and BTT-R1

MDEQ Scores for Surber Samples
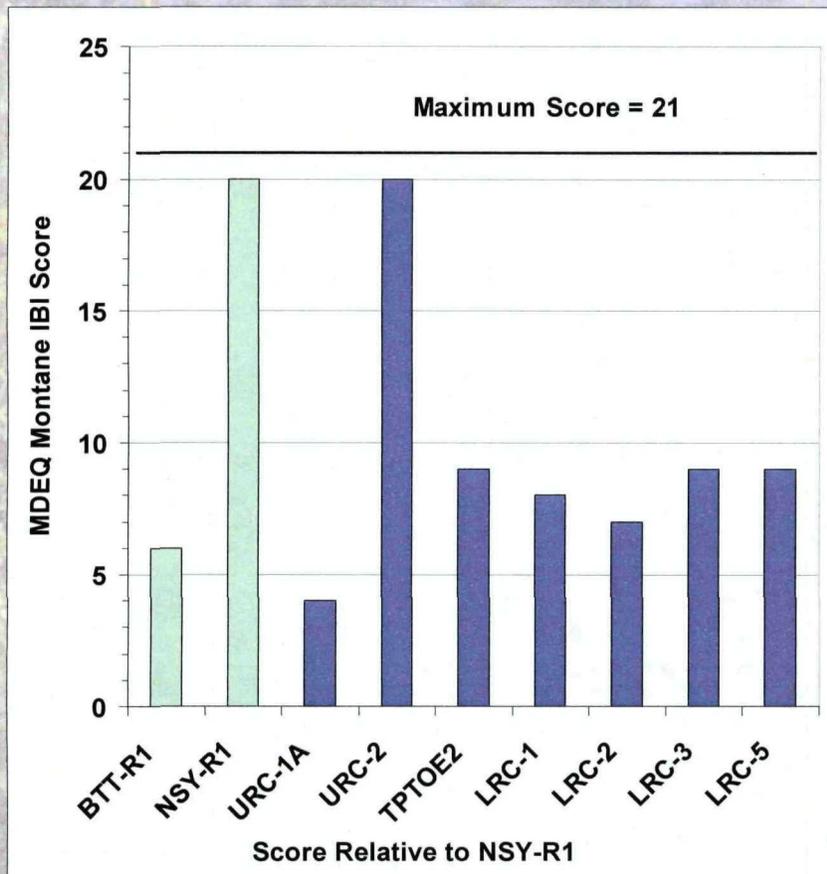
- In part due to low total taxa richness numbers the scores for URC-1A and BTT-R1 were affected
- The lower Rainy Creek sites, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5, all had lower MDEQ scores than NSY-R1
- The same sites had higher scores than BTT-R1
- The upper Rainy Creek site, URC-2 had the same score as NSY-R1
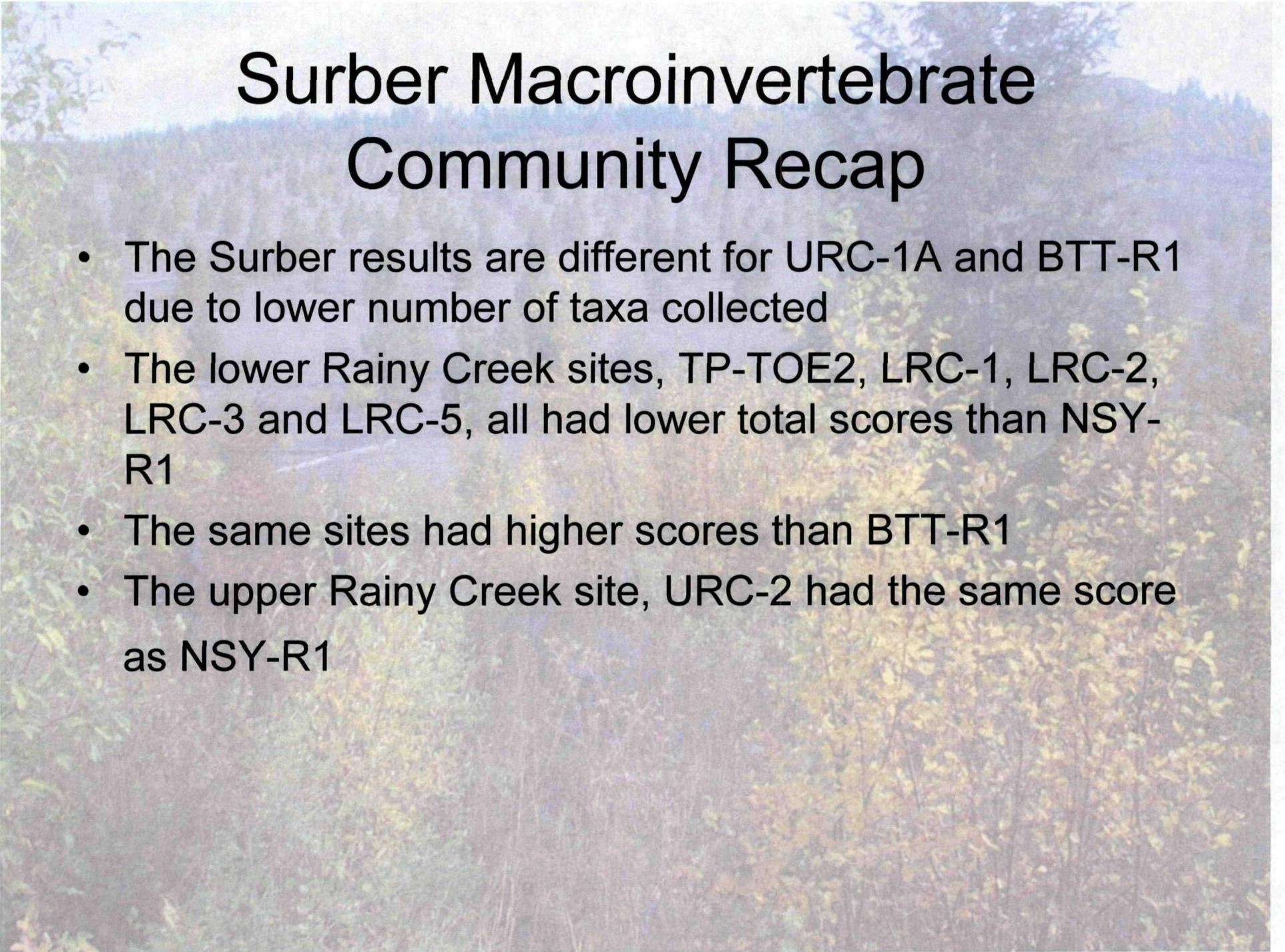
Surber Macroinvertebrate Community Recap

- The Surber results are different for URC-1A and BTT-R1 due to lower number of taxa collected
- The lower Rainy Creek sites, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5, all had lower total scores than NSY-R1
- The same sites had higher scores than BTT-R1
- The upper Rainy Creek site, URC-2 had the same score as NSY-R1

Correlations Between Sediment Quality Parameters and Aquatic Macroinvertebrates
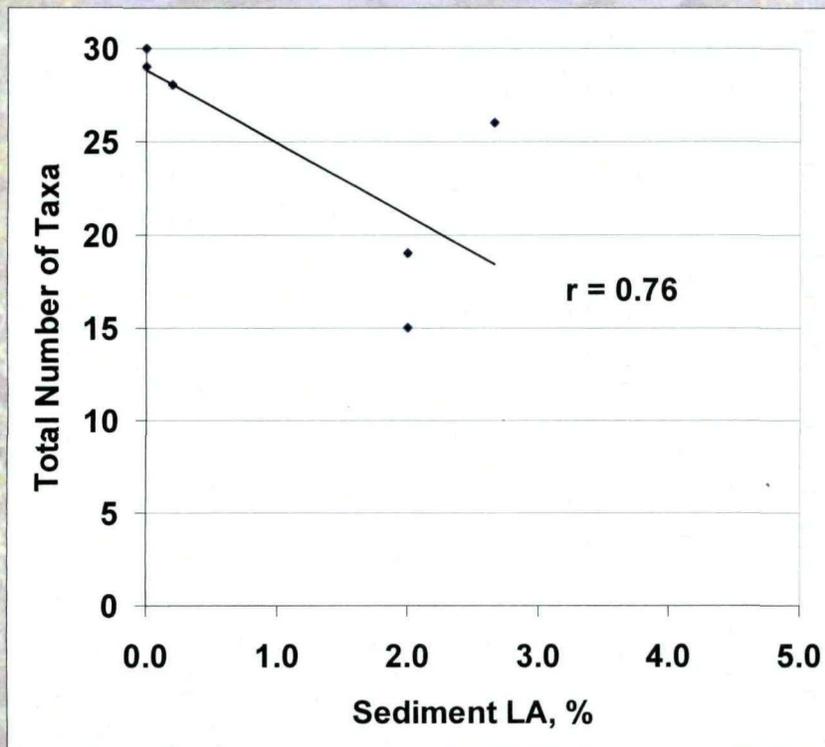
- Significant negative correlation b/w total number of taxa and LA concentration
- Correlations with LA maybe misleading
  - sediment toxicity bioassays (Hyalella, Chironomid) do not support a finding of effect
  - Habitat parameters maybe more important to invertebrate community
- There may not be enough observations to be conclusive

Correlations Between Habitat Parameters and Aquatic Macroinvertebrates
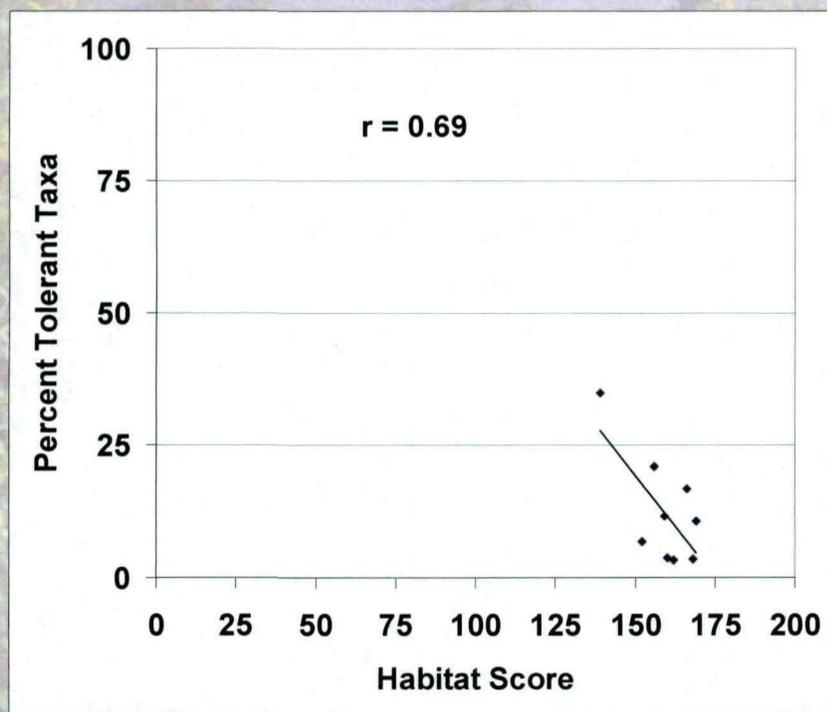
- Significant negative correlation b/w % tolerant taxa and habitat score
  - This is what would be expected
- There may not be enough observations to be conclusive
- More quantitative habitat information needed to explain site differences

Summary of Findings

- Preliminary habitat data imply OU3 sites are different from the reference sites
- The lower Rainy Creek sites, LRC-1, LRC-2, LRC-3 and LRC-5, were estimated to have smaller fish population sizes than the other sites
- BTT-R1 and NSY-R1 had higher macroinvertebrate biological condition scores than, TP-TOE2, LRC-1, LRC-2, LRC-3 and LRC-5
- Some habitat and sediment quality parameters correlate to RBP metrics

Recommendations

- Need to evaluate aspects of aquatic and riparian habitat quantitatively for fish and invertebrates, e.g.:
  - Stream substrate size should be quantified, a pebble count could be used
  - Stream velocity should be measured from more than five points in each stream reach
  - Riparian overhead cover should be estimated using a densiometer